



C/015/0019, Incoming

cc: Jim  
Ingraham

P.O. Box 310  
15 North Main Street  
Huntington, Utah 84528

#3594

R

**COPY**

July 14, 2010

Utah Division of Oil, Gas and Mining  
1594 West North Temple, Suite 1210  
P.O. Box 145801  
Salt Lake City, Utah 84114-5801

**Subj: Application for Phase II and Phase III Bond Release of the Cottonwood/Wilberg Miller Canyon Portals, PacifiCorp, Cottonwood/Wilberg Mine, C/015/0019, Emery County, Utah**

PacifiCorp, by and through its wholly-owned subsidiary, Energy West Mining Company ("Energy West"), as mine operator, hereby submits an application for Phase II and Phase III bond release of the Cottonwood/Wilberg Miller Canyon portal site. The said area covered by the bond is approximately 0.02 acres and is located in Township 17 South, Range 7 East, SE1/4 of Section 30, SLB&M. This area has met the regulations of the R645 Utah Coal Rules in regards to both Phase II and III bond release (R645-301-880.310).

The information included with this application provides documentation as required by Directive Number: Tech-006 and the R645-301-800 Utah Coal Regulations. This information is included as Attachments 1 through 11 and as follows:

**General Information for Bond Release**

- Attachment 1: Notarized Signature
- Attachment 2: Draft Letters to Interested Parties
- Attachment 3: Draft Newspaper Advertisement
- Attachment 4: Legal Description and Site Map
- Attachment 5: Reclamation Treatments Utilized
- Attachment 6: Cottonwood/Wilberg Mine Miller Canyon Portal Site General History of Mining and Reclamation Activities
- Attachment 7: Current Total Bond Amount and Incremental Amount Requested for Release

**Information for Phase II Bond Release**

- Attachment 8: Vegetation Analysis for Last Two Years of Responsibility
- Attachment 9: Demonstration that Area is Not Contributing Suspended Solids Outside Permit Area

**Information for Phase III Bond Release**

- Attachment 10: Demonstration that Responsibility Period has been Met
- Attachment 11: Demonstration that Post Mining Land Use has been Achieved

File in:

☐ Confidential

☐ Shelf

☒ Expandable

Date Folder 07/19/10 C/0150019

See: Incoming For additional information

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When Phase III Bond Release procedures are complete and application approved, the Cottonwood Mine MRP and Legal/Financial Volumes will be revised to reflect the changes to the mining and reclamation permit. The required C1 form is included with this application. Additional information for this site can be reviewed in the application for Phase I Bond Release of the Miller Canyon Portals approved June 21, 2002 (C/015/019-BR99D) contained in your files. If you have any questions or concerns regarding the enclosed information, please contact Dennis Oakley at 435-687-4825.

Sincerely,

*Kenneth S. Fleck*

Ken Fleck

Geology and Environmental Affairs Manager

Enclosures: C1 Form  
Attachments 1 through 12

Cc: Scott Child w/o attachments (Interwest Mining Company)  
DOGM, PFO w/attachments  
file

## APPLICATION FOR COAL PERMIT PROCESSING

**COPY**Permit Change ☒ New Permit ☐ Renewal ☐ Exploration ☐ Bond Release ☒ Transfer ☐

Permittee: PacifiCorp

Mine: Cottonwood/Wilberg Mine

Permit Number: C/015/0019

Title: Application for Phase II and Phase III Bond Release of the Cottonwood/Wilberg Miller Canyon Portals, PacifiCorp, Cottonwood/Wilberg Mine, C/015/0019, Emery County, Utah

Description, Include reason for application and timing required to implement:

Phase II and III Bond release of satelite facility. Timing: As required by Utah Coal Regulations

**Instructions:** If you answer yes to any of the first eight (gray) questions, this application may require Public Notice publication.

- ☐ Yes ☒ No 1. Change in the size of the Permit Area? Acres: to be decided later ☐ increase ☒ decrease.
- ☐ Yes ☒ No 2. Is the application submitted as a result of a Division Order? DO# \_\_\_\_\_
- ☐ Yes ☒ No 3. Does the application include operations outside a previously identified Cumulative Hydrologic Impact Area?
- ☐ Yes ☒ No 4. Does the application include operations in hydrologic basins other than as currently approved?
- ☐ Yes ☒ No 5. Does the application result from cancellation, reduction or increase of insurance or reclamation bond?
- ☒ Yes ☒ No 6. Does the application require or include public notice publication?
- ☐ Yes ☒ No 7. Does the application require or include ownership, control, right-of-entry, or compliance information?
- ☐ Yes ☒ No 8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
- ☐ Yes ☒ No 9. Is the application submitted as a result of a Violation? NOV # \_\_\_\_\_
- ☐ Yes ☒ No 10. Is the application submitted as a result of other laws or regulations or policies?
- Explain: \_\_\_\_\_
- ☒ Yes ☐ No 11. Does the application affect the surface landowner or change the post mining land use?
- ☐ Yes ☒ No 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2)
- ☐ Yes ☒ No 13. Does the application require or include collection and reporting of any baseline information?
- ☐ Yes ☒ No 14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
- ☐ Yes ☒ No 15. Does the application require or include soil removal, storage or placement?
- ☒ Yes ☐ No 16. Does the application require or include vegetation monitoring, removal or revegetation activities?
- ☐ Yes ☒ No 17. Does the application require or include construction, modification, or removal of surface facilities?
- ☐ Yes ☒ No 18. Does the application require or include water monitoring, sediment or drainage control measures?
- ☐ Yes ☒ No 19. Does the application require or include certified designs, maps or calculation?
- ☐ Yes ☒ No 20. Does the application require or include subsidence control or monitoring?
- ☒ Yes ☐ No 21. Have reclamation costs for bonding been provided?
- ☐ Yes ☒ No 22. Does the application involve a perennial stream, a stream buffer zone or discharges to a stream?
- ☐ Yes ☒ No 23. Does the application affect permits issued by other agencies or permits issued to other entities?

Please attach four (4) review copies of the application. If the mine is on or adjacent to Forest Service land please submit five (5) copies, thank you. (These numbers include a copy for the Price Field Office)

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

Kenneth Fleck  
Print Name

*Kenneth S. Fleck*  
Sign Name, Position, Date

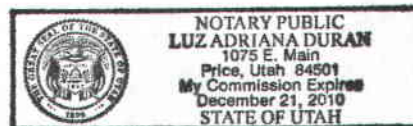
Manager of Environmental Affairs

Subscribed and sworn to before me this 14 day of JULY, 2010

*Suzanne Duran*  
Notary Public

My commission Expires:

Attest: State of UT Dec, 21, 2010 } ss:  
County of Emery



For Office Use Only:

Assigned Tracking Number:

Received by Oil, Gas &amp; Mining

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**Application for Phase II and III Bond Release**

**Miller Canyon Portal Site**

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**Attachment 1**  
**Notarized Signature**

**PacifiCorp**  
**Energy West Mining Company**  
**Cottonwood/Wilberg Mine**  
**C/015/0019**

**Phase II and III Bond Release on Approximately 0.02 Acres of Land Related to the Cottonwood/Wilberg Miller Canyon Portal Site.**

I hereby certify, to the best of my knowledge and belief, that all the information contained in this request is true and correct and that all applicable reclamation activities have been accomplished in accordance with the requirements of the Act, the regulatory program, and the approved reclamation plan.

Kenneth Fleck, Manager of Geology and Environmental Affairs

Print Name

Kenneth S. Fleck

Signature, Position, Date

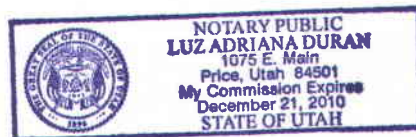
Subscribed and sworn to before me this 14 day of JULY, 2010.

Luz Adriana Duran

Notary Public

My Commission Expires: DEC, 21, 2010

Attest: State of UT  
County of Emery



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**Application for Phase II and III Bond Release  
Miller Canyon Portal Site**

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**Attachment 2  
Draft Letters to Interested Parties**

August xx, 2010

Interested Party Member  
1001 Any Street  
Any City, USA 10110

Subject: **Application for Phase III Bond Release, Cottonwood/Wilberg Mine, Miller Canyon Portal Breakout**

PacifiCorp, by and through its wholly-owned subsidiary, Energy West Mining Company ("Energy West") as mine operator, has filed with the Division of Oil, Gas and Mining an application for Phase III Bond Release for the Miller Canyon portal breakouts of the Cottonwood/Wilberg Mine.

As required by the State of Utah, R645-Coal Mining Rules (R645-301-880), all adjoining property owners, local governmental bodies, etc, are notified, informing them of the operator's intention to seek release from bond. You are receiving this notice because of your association with one of the groups mentioned above. A public notice was published in the Emery County Progress commencing on August xx, 2010 and will run for four (4) consecutive weeks.

The Miller Canyon breakouts are located in the NW1/4 SE1/4 of Section 30, Township 17 South, Range 7 East, SLB&M and within United States Forest Service Lands. PacifiCorp is the sub-leasee for Federal Coal Lease (U-083066) to conduct underground mining operations. Mining in this area is no longer being conducted in this area. Total disturbance associated with the ventilation breakouts is approximately 0.02 acres.

The Miller Canyon ventilation breakouts consisted of three separate portals located on the western side of East Mountain. The portals were developed in the coal outcrop and talus deposits on a vertical cliff face. As part of PacifiCorp's enhancement project, rock and aesthetically appealing materials were strategically placed along the coal outcrop area to blend the portal site to the surrounding terrain. Ground water discharges that occur from the portal area have been monitored according to the approved plan and Utah Pollution Discharge Elimination System guidelines. Seeps are common along the cliffs in this area.

On June 25, 1999, Energy West completed final reclamation of the portal sites as specified in the approved plan. Reclamation activities consisted of reconfiguration of the landscape to be consistent with the surrounding environment. Phase I bond release was approved on June 21, 2002.

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Application for Phase II and III Bond Release  
Cottonwood/Wilberg Mine  
Miller Canyon Portal Breakouts  
August xx, 2010

A Surety bond is posted with the Division for the Cottonwood/Wilberg mine in the amount of \$3,252,000.00. PacifiCorp is requesting Phase II and Phase III release of reclamation liability. Bond reduction is not requested at this time.

If you have any questions, comments, or concerns that require further information pertaining this bond release application, please feel free to call Dennis Oakley at (435) 687-4825.

Sincerely,

Dennis Oakley  
Sr. Environmental Engineer

Cc Gary Kofford, Chairman, Emery County Board of Commissioners  
Jerry Kenczka, Field Office Manager, Bureau of Land Management  
Pamela Brown, Forest Supervisor, USFS, Region 4, Manti-LaSal National Forest  
Dr. Phil Notorianni, Jr., Director, State Historic Preservation Office  
Eric Larson, Regional Supervisor, State of Utah, Division of Wildlife Resources  
Mark Stilson, Regional Engineer, State of Utah, Division of Water Rights  
Janis Smith, Closing/Lease Coordinator, The Church of Jesus Christ of Latter-Day Saints  
File

Application for Phase II and III Bond Release  
Cottonwood/Wilberg Mine  
Miller Canyon Portal Breakouts  
August xx, 2010

Notification List:

Gary Kofford, Chairman  
Emery County Board of Commissioners  
P.O. Box 629  
Castle Dale, Utah 84513

Jerry Kenczka, Field Office Manager  
Bureau of Land Management  
Price Field Office  
125 South 600 West  
Price, Utah 84501

Pamela Brown, Forest Supervisor  
United States Forest Service  
Region 4, Manti-LaSal National Forest  
599 West Price River Road  
Price, Utah 84501

Dr. Phil Notorianni, Jr., Director  
State Historic Preservation Office  
300 Rio Grande  
Salt Lake City, Utah 84101

Eric Larson, Regional Supervisor  
State of Utah  
Division of Wildlife Resources  
SOUTHEASTERN REGION  
319 North Carbonville Rd., Suite A  
Price, Utah 84501

Mark Stilson, Regional Engineer  
State of Utah  
Division of Water Rights  
Southeastern Area  
319 Carbonville Rd, Suite B  
Price, Utah 84501

Janis Smith  
Closing/Lease Coordinator  
The Church of Jesus Christ of Latter-Day Saints  
Real Estate Services Division  
50 East North Temple, Room 1205  
Salt Lake City, Utah 84150-6320

**Application for Phase II and III Bond Release  
Miller Canyon Portal Site**

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**Attachment 3  
Draft Newspaper Advertisement**

**Application for Phase III Bond Release  
Cottonwood/Wilberg Mine  
Miller Canyon Portal Breakouts  
C/015/0019  
Energy West Mining Company  
P.O. Box 310  
Huntington, Utah 84528**

PacifiCorp, by and through its wholly-owned subsidiary, Energy West Mining Company ("Energy West") as mine operator, has filed with the Division of Oil, Gas and Mining an application for Phase III Bond Release for the Miller Canyon portal breakouts of the Cottonwood/Wilberg Mine.

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The Miller Canyon ventilation breakouts consisted of three separate portals located on the western side of East Mountain. The portals were developed in the coal outcrop and talus deposits on a vertical cliff face. As part of PacifiCorp's enhancement project, rock and aesthetically appealing materials were strategically placed along the coal outcrop area to blend the portal site to the surrounding terrain. Ground water discharges that occur from the portal area have been monitored according to the approved plan and Utah Pollution Discharge Elimination System guidelines. Seeps are common along the cliffs in this area.

On June 25, 1999, Energy West completed final reclamation of the portal sites as specified in the approved plan. Reclamation activities consisted of reconfiguration of the landscape to be consistent with the surrounding environment. Phase I bond release was approved on June 21, 2002.

A Surety bond is posted with the Division for the Cottonwood/Wilberg mine in the amount of \$3,252,000.00. PacifiCorp is requesting Phase II and Phase III release of reclamation liability. Bond reduction is not requested at this time.

This notice is being published to comply with the Surface Mining Control and Reclamation Act of 1977 and State and Federal regulations promulgated pursuant to said Act.

Written comments or objections may be submitted to: State of Utah Department of Natural Resources, Division of Oil, Gas and Mining, 1594 West North Temple, Suite 1210, Box 145801, Salt Lake City, Utah 84114-5801.

Published in the Emery County Progress for four consecutive weeks beginning August xx, 2010.

**Application for Phase II and III Bond Release  
Miller Canyon Portal Site**

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**Attachment 4  
Legal Description and Map**

## **Legal Description for Phase II and III Bond Release**

The area under application for release of the Cottonwood/Wilberg Miller Canyon Portal area consists of a small ventilation breakout within Township 17 South, Range 7 East, Section 30, NW1/4 SE1/4. This area contains approximately 0.02 acres of reclaimed land.

Refer to the attached drawing for the location of the Miller Canyon Portals.

A topographic map of the Miller Canyon area. The map features contour lines indicating elevation, with labels such as 19, 20, 24, 25, 29, 31, 32, 36, and 37. Key locations marked include 'Miller Canyon', 'Cottonwood', 'Black Diamond Mine', 'Vent Mountain Mine', and 'Swellie'. A red dashed line runs through the center of the map. A black sun symbol is located near the center. Four blue arrows point to specific areas: one to the 'Miller Canyon Portals' (top left), one to the 'Staging Area' (top center), one to the 'Head' (bottom center), and one to a location near 'Swellie' (bottom right).

## Staging Area

# State Highway 29

**Application for Phase II and III Bond Release  
Miller Canyon Portal Site**

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**Attachment 5  
Reclamation Treatments**

## **Reclamation Treatments Utilized at the Cottonwood/Wilberg Miller Canyon Portal Breakouts**

### Environment Conditions

The rock formations exposed in the Miller Canyon Portal area are restricted to the Upper Cretaceous period. The formations, in ascending order, Star Point Sandstone, Blackhawk. The Star Point Sandstone, which is a prominent cliff former, consists of several eastward thinning marine sandstone tongues of medial Campanian age (Clark, 1928). Westward thinning wedges of the Masuk Shale interfinger with the basal tongues of the Star Point Sandstone. The three members are the basal Panther Sandstone, the middle Storrs Sandstone, and the upper Spring Canyon Sandstone. These sandstone units are generally separated from each other by westward projecting tongues of Mancos Shale.

The Blackhawk Formation overlies the Star Point Sandstone and is 625-800 feet thick in the Miller Canyon Portal area. The Blackhawk consists of alternating sandstones, siltstones, shales and coal deposited in a deltaic environment. The Hiawatha seam was naturally exposed prior to development mining at the Miller Canyon. The seam is approximately seven and half (7 ½) feet thick and consist of several mudstone splits in the upper portion of the seam. The sandstones contained within the Blackhawk Formation are fluvial and increase in number in the upper portions of the formation. Many of the tabular sandstone channels form local perched water tables. Several small seeps occur along the boundary of the Blackhawk and Star Point Sandstone formations.

Groundwater resources of the Miller Canyon area are limited to a series of seeps located near the formational contact between the Blackhawk and Star Point Sandstone formations and the gravity discharge from the old mine workings. The source of the groundwater seeps is from the winter snowpack which melts and infiltrates the lower Blackhawk Formation through vertical fractures. The groundwater flows down vertically until it intersects mudstone layers above and below the Hiawatha seam. Groundwater flow continues horizontally down dip through the permeable sandstone channels located above the Hiawatha seam and the upper member of the Star Point Sandstone Formation until it intersects the land surface in the form of seeps. Flow from the seeps is insufficient for quantity and quality determination.

Vegetation on the steep slopes of the Miller Canyon Portal area is dominated by Salina wildrye (*Elymus salinus*) and interspersed with Pinyon pine (*Pinus Edulis*) and Utah Juniper (*Juniperus Osteosperma*). Much of the ground cover not protected by live plant material is protected against erosion by rock fragments.

Elevation of the site is approximately 7,500 feet above sea level. Slopes are steep at approximately 35 degrees with exposures primarily to the southeast. Land use in the Miller Canyon Portals area is grazing and wildlife. Given the fact that the portals are located on steep (nearly vertical) rock outcrops, this area is only considered for wildlife. It is highly unlikely that cattle could access the steep ledges in and around the portal areas.

## Reclamation

Backfilling and grading was conducted utilizing helicopter support. The helicopter lifted the rock and soil material and transported it to the portal sites using a long-line and cargo box. The material was dumped at each of the three portals.

The initial reclamation plan called for approximately 48 yards of material to complete each portal. It was anticipated that the helicopter would be able to transport 1200 to 1400 pounds. As transportation began, it was found that only about 600 to 700 pounds could be lifted. The only other resource for material was the surrounding area of the portals. Large boulders and soil was utilized along with approximately 150 helicopter loads. It was estimated that approximately 50 cubic yards of material was imported by helicopter. The remainder of the material to fill the portals came from the surrounding area.

Six inch rock material was utilized first to create a french drain to enable mine discharge to flow from the portal area. As the helicopter dumped its load at the portal, the rock material was moved by hand to insure all areas, including all exposed coal seams, of the portal were covered. The rock material was pushed back into the portal as far as possible for complete closure.

Soil material was placed to a thickness of at least 18 inches. Litter material was placed on the newly graded soil to control erosion. Slopes developed during backfilling are consistent with surrounding terrain. The area was revegetated using the following seed mix:

### Seed Mixture - Final Revegetation for the Miller Canyon Portal Breakouts

<u>Common Name</u>	<u>Scientific Name</u>	<u>PLS*</u>	Lbs/Acre
<u>Grasses</u>			
Western wheatgrass	Agropyron smithii	3	
Bluebunch wheatgrass	Agropyron spicatum	3	
Indian ricegrass	Oryzopsis hymenoides	3	
Needle and thread grass	Stipa comata	1	
Thickspike wheatgrass	Agropyron dasystachyum	1	
Great Basin wildrye	Elymus ciaereus	2	
<u>Forbs</u>			
Blueleaf aster	Aster glaucodes	.5	
Utah sweet vetch	Hedysarum boreale	1	
Lewis flax	Linum lewisii	1	
Globemallow	Sphaeralcea coccinea	.5	
Yarrow	Achillea millefolius	.5	
Palmer penstemon	Penstemon palmeri	1	
<u>Shrubs</u>			
Serviceberry	Amelanchier alnifolia	1	
Fourwing saltbush	Atriplex canescens	2	
Green Mormon tea	Ephedra viridis	1	
Wyoming big sagebrush	Artemesia wyomingensis	.5	
Big white rabbitbrush	Chrysothamunus nauseosus		
	var. albicaulis	.5	
	<b>Total</b>	<b>22.5</b>	

The total disturbance before reclamation was approximately 0.02 acres. This equates to approximately 0.5 lbs. of pure live seed to complete revegetation at the Miller Canyon portals.

Lastly, the 2 inch water monitoring pipe that was located in the drainage of the canyon was removed. The pipe was transported out of the canyon by helicopter and disposed at the county landfill.

**Application for Phase II and III Bond Release  
Miller Canyon Portal Site**

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**Attachment 6  
General History of the Site**

## **General History of Cottonwood/Wilberg Miller Canyon Portal Breakouts**

The Miller Canyon portals were developed as intake portals in October of 1981. This facility consisted of three 8 ft. x 16 ft. portals on 100 ft. centers. The portals were used for intake purposes until the Wilberg Mine fire in December 1984. At that time they were temporarily sealed. The portal furthest east (portal #1) was reopened in 1985 for exploration purposes after the mine fire. The portals were subsequently sealed permanently (MSHA approved) in 1987.

Portal #1 was provided with a 2 inch water monitoring pipe. Small quantity discharges occur at this point. The discharges to this date are monitored in accordance with stipulations in the UPDES Permit, UT-0022896-004. No discharges have been recorded at site 004 since 1996.

A field investigation of the portals in May, 1999 revealed that there had been some caving of the portal openings. The pipe in the #1 portal had been pinched off allowing mine discharge water to flow freely over the rock ledge to the canyon floor. The total disturbance of these portals was approximately 0.02 acres.

A field visit was conducted on June 16, 1999 of the portal area by Energy West officials, USFS, and DWR. This visit enabled the responsible managing agencies to see the area in which the portals are located and review reclamation methods. The USFS, being the land managing agency, had interest with the reclamation methods. The DWR involvement was required because of an active eagle nest that occurred in the canyon. The DWR required the eagle nest to be monitored by a qualified independent contractor. Both government entities concurred with the reclamation plan.

Reclamation was accomplished utilizing helicopter support for transporting materials from the staging area in Cottonwood Canyon to the portal areas in Miller Canyon. The staging area in Cottonwood Canyon was located approximately 2 miles from the junction of State Highway 29 on Emery County Road 506. The Emery County road department occasionally uses this area as a road chip storage area. A road encroachment application was submitted to Emery County and approved on June 2, 1999. Reclamation was completed within four days ending on June 25, 1999. No structures remain at the site.

Initially, Energy West Mining Company applied for Phase III Bond Release for the Miller Canyon Portal Breakouts because it small insignificant disturbed area. However, the Division had concerns with this procedure and required that the area follow a proper bond release sequence that meets the requirements of R645 Coal Regulations. At that time, density for shrubs and wood species was set to zero (0).

Phase I Bond Release was approved on June 21, 2002. Vegetation monitoring for the last two years of operator responsibility was conducted in September 2008 and September 2009. This monitoring found that the area has met all vegetation standards of success outlined in the Mining and Reclamation Plan (MRP).

**Application for Phase II and III Bond Release  
Miller Canyon Portal Site**

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**Attachment 7  
Current Total Bond Amount and Incremental Amount  
Requested for Release**

**Current Total Bond Amount and Incremental Amount Requested for Release**

There is no incremental bond amount calculated for the Miller Canyon Portal area. PacifiCorp is not requesting any surety for the Cottonwood Mine to be reduced or released as part of this action.

**Application for Phase II and III Bond Release  
Miller Canyon Portal Site**

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**Attachment 8  
Vegetation Analysis (2008/2009 Field Seasons)**

**VEGETATION MONITORING  
IN  
MILLER CANYON**  
Sample Year 1: 2008



*Prepared by*

**MT. NEBO SCIENTIFIC, INC.**

330 East 400 South, Suite 6  
P.O. Box 337  
Springville, Utah 84663  
(801) 489-6937

Patrick D. Collins, Ph.D.

*for*

**ENERGY WEST MINING COMPANY**

P.O. Box 310  
Huntington, Utah 84528



April 2009

# TABLE OF CONTENTS

INTRODUCTION .....	1
METHODS .....	2
Transect Placement .....	2
Cover, Frequency and Composition .....	3
Density .....	3
Sample Adequacy .....	3
Diversity .....	4
Similarity Index .....	4
Photographs .....	5
RESULTS .....	5
Reclaimed Portals .....	5
Reference Area .....	6
CONCLUSIONS .....	7
COLOR PHOTOGRAPHS OF THE SAMPLE AREAS .....	9
DATA SUMMARY TABLES .....	12
MAP OF SAMPLE AREAS .....	15

## INTRODUCTION

Miller Canyon is a tributary of Cottonwood Canyon and is located in Emery County, Utah approximately 11 miles northwest of the town of Orangeville (Map 01). There were three portals in Miller Canyon, each only about 0.01 acre in size, that were once used for coal mine ventilation and limited access during mining activities in the area. In 2000, these portals were reclaimed with the goal to restore the disturbed plant communities to “*diverse, effective and permanent*” as dictated by the applicable regulations. Elevation of the study site is about 7,500 ft above sea level. Slopes of the study areas were relatively steep at approximately 35 degrees with exposures primarily to the southeast.

Following final reclamation and revegetation of a mine site, a “*responsibility period*” for at least 10 years is required before the mine operator can submit a request for *Final or Phase III Bond Release* through state and federal regulatory authorities. It has been estimated that this period of time is long enough to determine whether or not adequate re-establishment of a given reclaimed plant community has occurred on sites at this precipitation zone in western United States.

Rehabilitated vegetation is usually monitored throughout the responsibility period, but beginning at year 9 of the 10-year period, intensive sampling can be initiated for two consecutive years to determine whether or not the reclaimed site has met pre-determined revegetation success standards. The vegetation of the reclaimed land must meet specific state and federal requirements.

The purpose of this document is to compare a reclaimed area of a mine site with specific pre-determined standards for revegetation success. The content of this report provides **Year 1** results of the two consecutive years of sampling required prior to submittal of an application for bond release by the mine operator through the State of Utah, Division of Oil, Gas & Mining (DOGM). This document provides quantitative data comparisons of a *reclaimed portals* with a *reference area* where an undisturbed native plant community was chosen in the immediate area to represent revegetation success standards. The reference area was chosen in an attempt to have similar slopes, soils, exposure, species composition, precipitation, elevation and other environmental variables of the plant communities in the portal area before they were disturbed.

## METHODS

### Transect Placement

Transect lines for quantitative sampling were randomly placed the length of the reclaimed portals and reference areas in an attempt to adequately represent each sample area as a whole. From these transect lines, sample locations were chosen using random numbers at right angles to them. The three portals were sampled with an equal amount of samples. The sample data were then combined to create a single dataset for each parameter.

### Cover, Frequency and Composition

Cover estimates were made using ocular methods with meter square quadrats. Species composition and relative frequencies were also assessed from the quadrats. Additional information recorded on the raw data sheets were: estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Plant nomenclature follows "*A Utah Flora*" (Welsh et al. 2003).

### Density

Density estimates for the woody plant species on the reclaimed areas were made belt transects. Because the area of the portals were so small in size, enough belts were placed to virtually count all woody plants at each of the three portal sites. No woody species estimates were required in the reference area according to Energy West's Mining and Reclamation Plan.

### Sample Adequacy

Sample adequacy for cover was attempted with the goal that 90% of the samples were within 10% of the true mean for the plant communities in the area. The following formula was used:

$$n_{MIN} = \frac{t^2 s^2}{(dx)^2}$$

where,

$n_{MIN}$	= minimum adequate sample
t	= appropriate confidence t-value
s	= standard deviation
x	= sample mean
d	= desired change from mean

## Diversity

Two diversity indices have been reported in this document for the reclaimed portals and the reference area. To begin, *MacArthur's Diversity Index* was calculated. This index is an effective diversity measurement and is computed using the equation  $1/\sum p_i^2$  (MacArthur and Wilson 1976, *The Theory of Island Biogeography*, Princeton: Princeton University Press). In this equation  $p_i$  is the proportion of sum frequency contributed by the  $i$ th species in the sample area of concern. The proportional contribution of each species is then squared and the values for all species in the sample areas are summed. This index integrates the number of species and the degree to which frequency of occurrence was equitably distributed among those species. In other words, this index provides greater weight to those species that are present more often (with greater frequency) than those that are merely "present" in one or two quadrats. The *average number of species* per sample quadrat is another measure of species diversity provided from the data in this report.

## Similarity Index

There are several well-documented methods to assess similarities in plant communities. The "Motyka Index" is a modified form of the "Sorenson Index", but both are similarity indices. This

index was used on the data and the equation is shown below:

$$IS_{MO} = \left( \frac{2MW}{MA + MB} \right) \times 100$$

where,

MW =  $\sum$  of the smaller quantitative values of species of two communities,  
MA =  $\sum$  of the quantitative values of all species in one community,  
MB =  $\sum$  of the quantitative values of all species in another community.

### Photographs

Color photographs were taken of the sample areas and are included in this report.

## **RESULTS**

### Reclaimed Portals

Quantitative data for cover, cover by species, composition, and woody species density were recorded at the Reclaimed Portals in Miller Canyon (see Color Photographs). The portals were dominated by Salina wildrye (*Elymus salinus*), western wheatgrass (*E. smithii*) and thickspike wheatgrass (*E. lanceolatus*). All species present in the sample quadrats along with their cover and frequency values are shown on Table 1. The total living cover of this reclaimed area was estimated at 39.17% (Table 2-B). Of this cover, grasses comprised 59.94%, shrubs 37.91% and forbs 2.15% (Table 2-B). Woody species density totaled 3,293 plants per acre (Table 3) and was dominated by broom snakeweed (*Gutierrezia sarothrae*), coyote willow (*Salix exigua*), fourwing

saltbush (*Atriplex canescens*) and rabbitbrush (*Chrysothamnus nauseosus*).

### Reference Area

The reference area chosen in the area to be used for final revegetation success standards was an Salina wildrye (with scattered pinyon-juniper) plant community (see Color Photographs). This community was also sampled for the same parameters during the same period to enable the results to be compared to the results of the reclaimed portals.

The understory living cover had many species present, but was dominated by Salina wildrye by a wide margin. For a cover and frequency listing of all species present in the sample quadrats refer to Table 4. The total living cover of the Reference Area was estimated at 33.75% (Table 5-A); the composition of this cover consisted of 66.12% grasses and 33.88% shrubs (Table 5-B).

## CONCLUSIONS

Results from the summary tables have been described in the RESULTS section above. These data have been

used to compare

the reclaimed and

reference areas

statistically.

When Student's t-

tests were

employed to

compare areas, the

**total living cover**

of the Reclaimed

FIGURE 1: Statistical summary sheet for the reclaimed portals and reference areas in Miller Canyon (2008).

### RECLAIMED PORTALS

Total Living Cover	$\bar{x}=39.17$	$s=5.18$	$n=30$	$nMIN=4.73$
--------------------	-----------------	----------	--------	-------------

### REFERENCE AREA

Total Living Cover	$\bar{x}=33.75$	$s=6.10$	$n=20$	$nMIN=8.84$
--------------------	-----------------	----------	--------	-------------

### STATISTICAL ANALYSES

Total Living Cover	$t=3.375$	$df=48$	$SL=p<.01$
--------------------	-----------	---------	------------

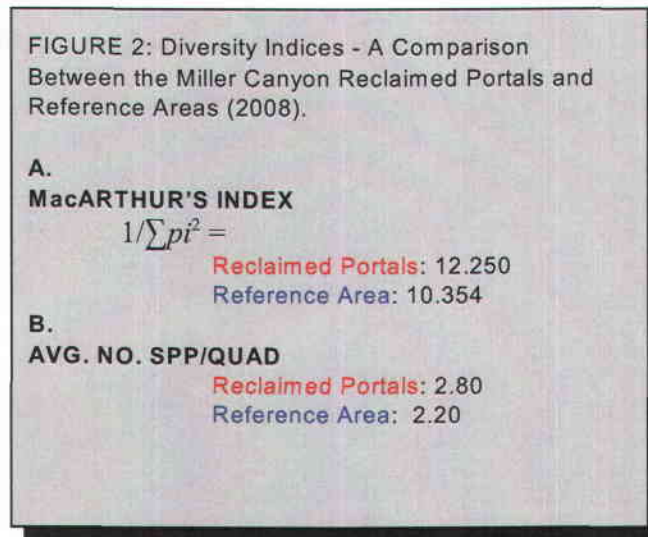
$\bar{x}$ = sample mean,  $s$  = sample standard deviation,  $n$  = sample size,  
 $nMIN$ = minimum adequate sample (@ 90%  $\pm$  .10)  
 NS = non-significant,  $t$  = Student's t-value,  $df$  = degrees of freedom,  
 SL = significance level,  $p$  = probability level

Portals was significantly greater than the Reference Area (Figure 1).

Next, **diversity indices** of the two areas were compared. *MacArthur's Index* suggested that the Reclaimed Portals were more diverse than the Reference Area (Figure 2-A). Moreover, the *average number of plant species per quadrat* was higher in the Reclaimed Portals compared to the Reference Area (Figure 2-B).

Finally, a **similarity index** for the two areas was compared. Motyka's Index indicates that the

Reclaimed Portals were nearly 85% similar (Figure 3). The standard for similarity described in Energy West's MRP indicates that *"the index value is at least 70% of the reference area"*.



In conclusion, for Year 1 of the two years required by DOGM to study and sample near the end of the *Responsibility Period* of the mine operator, the Reclaimed Portals in Miller Canyon appears to have met the standards set for revegetation success. These standards were derived from a native, undisturbed plant community that was located adjacent to the reclaimed areas.

FIGURE 3: MOTYKA INDEX - A Comparison Between the Miller Canyon Reclaimed Portals and Reference Areas.

$$IS_{MO} = \left( \frac{2MW}{MA + MB} \right) \times 100 = 84.827$$

**COLOR PHOTOGRAPHS  
OF THE  
SAMPLE AREAS**



Reclaimed Area (East Portal)



Reclaimed Area (Middle Portal)



Reclaimed Area (West Portal)



Reference Area



Reference Area



Reference Area

## **DATA SUMMARY TABLES**

**Table 1: Cover and frequency by plant species (2008).**

<b>MILLER CANYON PORTALS</b>			
	<b>MEAN</b>	<b>STD. DEV.</b>	<b>FREQUENCY</b>
<b>TREES &amp; SHRUBS</b>			
<i>Atriplex canescens</i>	4.17	8.07	23.33
<i>Chrysothamnus nauseosus</i>	2.67	5.88	20.00
<i>Eriogonum corymbosum</i>	1.33	3.64	13.33
<i>Gutierrezia sarothrae</i>	4.40	5.75	43.33
<i>Salix exigua</i>	2.83	7.71	13.33
<b>FORBS</b>			
<i>Penstemon palmeri</i>	0.57	1.73	10.00
<i>Ranunculus cymbalaria</i>	0.33	1.80	3.33
<b>GRASSES</b>			
<i>Agrostis stolonifera</i>	1.33	4.07	10.00
<i>Elymus cinereus</i>	2.33	5.59	16.67
<i>Elymus lanceolatus</i>	4.77	9.32	30.00
<i>Elymus salinus</i>	7.33	10.06	40.00
<i>Elymus smithii</i>	6.77	7.78	53.33
<i>Juncus sp.</i>	0.33	1.80	3.33

**Table 2: Total cover and composition (2008).**

**MILLER CANYON PORTALS**

<b>A. COVER</b>	<b>MEAN</b>	<b>STD. DEV.</b>
Total Living Cover	39.17	5.18
Litter	14.50	5.82
Bareground	14.33	7.82
Rock	32.00	7.48

**B. % COMPOSITION**

Shrubs	37.91	24.74
Forbs	2.15	5.65
Grasses	59.94	25.26

**Table 3: Woody species density (2008).**

<b>MILLER CANYON PORTALS</b>	<b>Number/Acre</b>
<i>Artemisia tridentata</i>	32.93
<i>Atriplex canescens</i>	460.95
<i>Atriplex confertifolia</i>	32.93
<i>Chrysothamnus nauseosus</i>	395.10
<i>Eriogonum corymbosum</i>	230.48
<i>Gutierrezia sarothrae</i>	1218.23
<i>Salix exigua</i>	888.95
<i>Tamarix chilensis</i>	32.93
<b>TOTAL</b>	<b>3292.52</b>

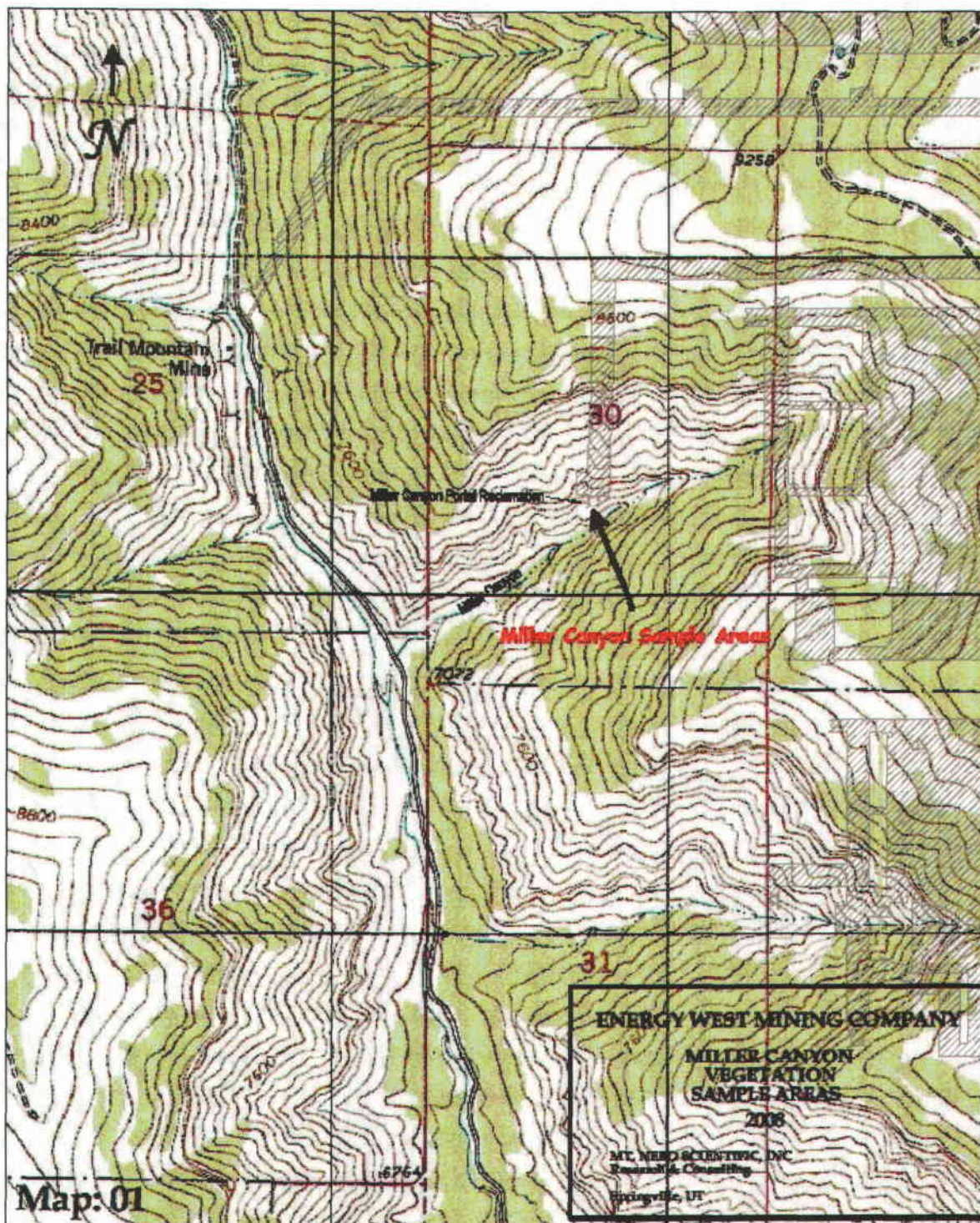
**Table 4: Cover and frequency by plant species (2008).**

<b>MILLER CANYON REFERENCE AREA</b>			
	<b>MEAN</b>	<b>STD. DEV.</b>	<b>FREQUENCY</b>
<b>TREES &amp; SHRUBS</b>			
<i>Atriplex confertifolia</i>	0.25	1.09	5.00
<i>Chrysothamnus nauseosus</i>	1.50	4.50	15.00
<i>Eriogonum corymbosum</i>	4.35	7.14	30.00
<i>Gutierrezia sarothrae</i>	4.65	4.34	65.00
<i>Salix exigua</i>	1.25	3.83	10.00
<b>FORBS</b>			
<b>GRASSES</b>			
<i>Elymus salinus</i>	21.75	9.78	95.00

**Table 5: Total cover and composition (2008).**

**MILLER CANYON  
REFERENCE AREA**

<b>A. COVER</b>		
Total Living Cover	33.75	6.10
Litter	13.00	7.48
Bareground	15.50	7.40
Rock	37.75	12.79
<b>B. % COMPOSITION</b>		
Shrubs	33.88	27.19
Forbs	0.00	0.00
Grasses	66.12	27.19





**VEGETATION MONITORING**  
**IN**  
**MILLER CANYON**  
Sample Year 2: 2009



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## TABLE OF CONTENTS

INTRODUCTION.....	1
METHODS.....	2
Transect Placement.....	3
Cover, Frequency and Composition.....	3
Density.....	3
Sample Adequacy.....	4
Diversity.....	4
Similarity Index.....	5
Photographs.....	5
RESULTS.....	6
Reclaimed Portals.....	6
Reference Area.....	6
CONCLUSIONS.....	7
COLOR PHOTOGRAPHS OF THE SAMPLE AREAS.....	10
DATA SUMMARY TABLES.....	12
MAP OF SAMPLE AREAS.....	14

## INTRODUCTION

Miller Canyon is a tributary of Cottonwood Canyon and is located in Emery County, Utah approximately 11 miles northwest of the town of Orangeville (Map 01). There were three portals in Miller Canyon, each only about 0.01 acre in size, that were once used for coal mine ventilation and limited access during mining activities in the area. In 2000, these portals were reclaimed with the goal to restore the disturbed plant communities to “*diverse, effective and permanent*” as dictated by the applicable regulations.

Elevation of the study site is about 7,500 ft above sea level. Slopes of the study areas were relatively steep at approximately 35 degrees with exposures primarily to the southeast.

Following final reclamation and revegetation of a mine site, a “*responsibility period*” for at least 10 years is required before the mine operator can submit a request for *Final or Phase III Bond Release* through state and federal regulatory authorities. It has been estimated that this period of time is long enough to determine whether or not adequate re-establishment of a given reclaimed plant community has occurred on sites at this precipitation zone in western United States.

Rehabilitated vegetation is usually monitored throughout the responsibility period, but beginning at year 9 of the 10-year period, intensive sampling can be initiated for two consecutive years to determine whether or not the reclaimed site has met pre-determined revegetation success standards. The vegetation of the reclaimed land must meet specific state and federal

requirements.

**Year 1** of the two required final monitoring years was sampled in 2008, followed by a final report that was submitted to Emery Mining Company called: VEGETATION MONITORING IN MILLER CANYON: SAMPLE YEAR 1 (2008).

The purpose of this document is to report the results of **Year 2** quantitative sampling, analyses and statistical comparisons between the reclaimed area of the mine site with specific pre-determined standards for revegetation success. The results will also determine where or not the site could be a candidate for bond release through the State of Utah, Division of Oil, Gas & Mining (DOGM).

This document provides quantitative data comparisons of a *reclaimed portals* with a *reference area* where an undisturbed native plant community was chosen in the immediate area to represent revegetation success standards. The reference area was chosen in an attempt to have similar slopes, soils, exposure, species composition, precipitation, elevation and other environmental variables of the plant communities in the portal area before disturbance.

## METHODS

### Transect Placement

Transect lines for quantitative sampling were randomly placed the length of the reclaimed portals and reference areas in an attempt to adequately represent each sample area as a whole. From these transect lines, sample locations were chosen using random numbers at right angles to them. The three portals were sampled with an equal number of samples. The sample data were then combined to create a single dataset for each parameter.

### Cover, Frequency and Composition

Cover estimates were made using ocular methods with meter square quadrats. Species composition and relative frequencies were also assessed from the quadrats. Additional information recorded on the raw data sheets were: estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Plant nomenclature follows "*A Utah Flora*" (Welsh et al. 2008).

### Density

Density estimates for the woody plant species on the reclaimed areas were made with belt transects. Because the area of the portals were so small in size, enough belts were placed to

virtually count all woody plants at each of the three portal sites. *No woody species estimates were required in the reference area according to Energy West's Mining and Reclamation Plan.*

### Sample Adequacy

Sample adequacy for cover was attempted with the goal that 90% of the samples were within 10% of the true mean for the plant communities in the area. The following formula was used:

$$nMIN = \frac{t^2 s^2}{(dx)^2}$$

where,

$nMIN$	= minimum adequate sample
$t$	= appropriate confidence t-value
$s$	= standard deviation
$x$	= sample mean
$d$	= desired change from mean

### Diversity

Two diversity indices have been reported in this document for the reclaimed portals and the reference area. To begin, *MacArthur's Diversity Index* was calculated. This index is an effective diversity measurement and is computed using the equation  $1/\sum pi^2$  (MacArthur and Wilson 1976, *The Theory of Island Biogeography*, Princeton: Princeton University Press). In this equation  $pi$  is the proportion of sum frequency contributed by the  $i$ th species in the sample area of concern. The proportional contribution of each species is then squared and the values for all species in the sample areas are summed. This index integrates the number of species and the degree to which frequency of occurrence was equitably distributed among those species. In other words, this

index provides greater weight to those species that are present more often (with greater frequency) than those that are merely “present” in one or two quadrats.

The *average number of species* per sample quadrat is another measure of species diversity provided from the data in this report.

### Similarity Index

There are several well-documented methods to assess similarities in plant communities. The “Motyka Index” is a modified form of the “Sorenson Index”, but both are similarity indices. This index was used on the data and the equation is shown below:

$$IS_{MO} = \left( \frac{2MW}{MA + MB} \right) \times 100$$

where,

MW =  $\sum$  of the smaller quantitative values of species of two communities,  
MA =  $\sum$  of the quantitative values of all species in one community,  
MB =  $\sum$  of the quantitative values of all species in another community.

### Photographs

Color photographs were taken of the sample areas and are included in this report.

## RESULTS

### Reclaimed Portals

Quantitative data for cover, cover by species, composition, and woody species density were recorded at the reclaimed portals in Miller Canyon (see Color Photographs). The portals were dominated by western wheatgrass (*Elymus smithii*) and Salina wildrye (*E. salinus*). All species present in the sample quadrats along with their cover and frequency values are shown on Table 1. The total living cover of this reclaimed area was estimated at 39.50% (Table 2-A). Of this cover, grasses comprised 65.26%, shrubs 33.07% and forbs 1.67% (Table 2-B). Woody species density totaled 3,436 plants per acre (Table 3) and was dominated by broom snakeweed (*Gutierrezia sarothrae*), coyote willow (*Salix exigua*), rabbitbrush (*Chrysothamnus nauseosus*) and fourwing saltbush (*Atriplex canescens*).

### Reference Area

The reference area chosen in the area to be used for final revegetation success standards was a Salina wildrye (with scattered pinyon-juniper) plant community (see Color Photographs). This community was also sampled for the same parameters during the same period to enable the results to be compared to the results of the reclaimed portals.

The understory living cover had several species present, but was dominated by Salina wildrye by a wide margin. For a cover and frequency listing of all species present in the sample quadrats

refer to Table 4. The total living cover of the reference area was estimated at 34.50% (Table 5-A); the composition of this cover consisted of 66.25% grasses, 33.20% shrubs and 0.56% forbs (Table 5-B).

## CONCLUSIONS

Summaries for the quantitative data have been described in the RESULTS section above. These data have been used to compare the reclaimed and

FIG. 1: Statistical summary sheet for the reclaimed portals and reference areas in Miller Canyon (2009).

### RECLAIMED PORTALS

Total Living Cover	$\bar{x}$ =39.50	s=7.89	n=30	nMIN=10.80
--------------------	------------------	--------	------	------------

### REFERENCE AREA

Total Living Cover	$\bar{x}$ =34.50	s=5.89	n=20	nMIN=7.89
--------------------	------------------	--------	------	-----------

### STATISTICAL ANALYSES

Total Living Cover	t=2.417	df=48	SL=p<.05
--------------------	---------	-------	----------

$\bar{x}$  = sample mean, s = sample standard deviation, n = sample size,  
nMIN= minimum adequate sample (@ 90%  $\pm$  0.10)

NS = non-significant, t = Student's t-value, df = degrees of freedom,

SL = significance level, p = probability level

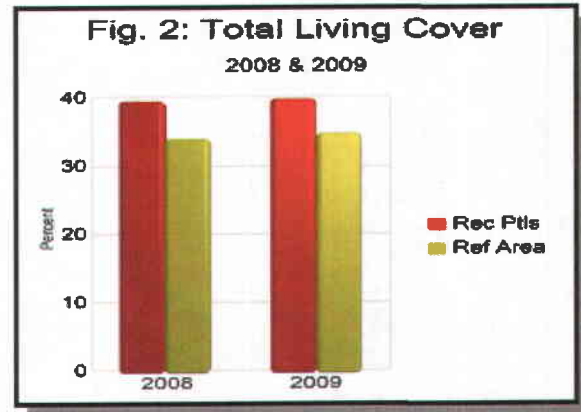
o=overstory; u=understory

reference areas statistically. *To facilitate comparisons between the two consecutive years required for potential bond release, both 2008 and 2009 results have been added to the figures in this report.* As mentioned, the complete dataset for 2008 can be reviewed by referring to the earlier, **Year 1** report.

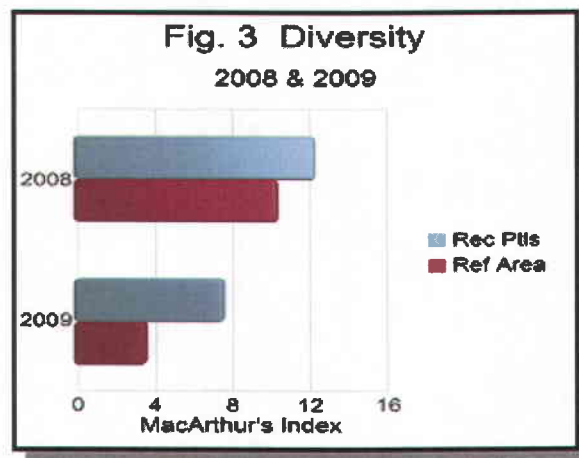
When Student's t-tests were employed to compare areas for 2009, the **total living cover** of the reclaimed portals was significantly greater than the reference area (Fig. 1). [NOTE: The same

results were found for this parameter in 2008.] A graphical comparison of the 2008 and 2009 datasets for **total living cover** is shown on Fig. 2.

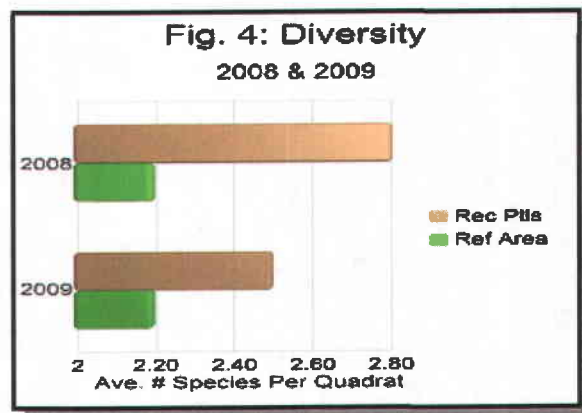
Next, **diversity indices** of the two areas were compared. *MacArthur's Index*



suggested that the reclaimed portals were more diverse than the reference area (Fig. 3).



Furthermore, the *average number of plant species per quadrat* was higher in the reclaimed portals compared to the reference area both years (Fig. 4).



Finally, a **similarity index** for the two areas was compared. Motyka's Index indicates that the reclaimed portals were

nearly 85% similar to the reference area in 2008, and 81% similar in 2009 (Fig.

4). The standard for similarity described in Energy West's MRP indicates that "*the index*

*value is at least 70% of the reference area*".

FIG. 5: MOTYKA INDEX - A Comparison Between the Miller Canyon Reclaimed Portals and Reference Areas (2008 & 2009).

$$IS_{MO} = \left( \frac{2MW}{MA+MB} \right) \times 100 =$$

$$2008 = 84.827$$

$$2009 = 81.151$$

In conclusion, for **Year 1** (2008) and **Year 2** (2009) of the two consecutive years required by DOGM to study near the end of the *Responsibility Period* of the mine operator, the reclaimed portals in Miller Canyon appears to have met the standards set for revegetation success. These standards were derived from a native, undisturbed plant community that was located adjacent to the reclaimed areas.

## COLOR PHOTOGRAPHS OF THE SAMPLE AREAS RECLAIMED PORTALS



East Portal



Middle Portal



West Portal

## REFERENCE AREA



## DATA SUMMARY TABLES

**Table 1: Cover and frequency by plant species (2009).**

<b>MILLER CANYON PORTALS</b>			
	<b>MEAN</b>	<b>STD. DEV.</b>	<b>FREQUENCY</b>
<b>TREES &amp; SHRUBS</b>			
<i>Artemisia tridentata</i>	0.50	2.69	3.33
<i>Atriplex canescens</i>	4.17	8.86	23.33
<i>Chrysothamnus nauseosus</i>	3.00	7.02	16.67
<i>Eriogonum corymbosum</i>	0.27	1.44	3.33
<i>Gutierrezia sarothrae</i>	3.23	5.58	33.33
<i>Salix exigua</i>	2.83	8.63	10.00
<b>FORBS</b>			
<i>Cirsium sp.</i>	0.33	1.80	3.33
<i>Smilicina stellata</i>	0.33	1.80	3.33
<b>GRASSES</b>			
<i>Agrostis stolonifera</i>	2.83	6.91	16.67
<i>Elymus cinereus</i>	0.17	0.90	3.33
<i>Elymus lanceolatus</i>	2.67	6.29	20.00
<i>Elymus salinus</i>	8.33	10.59	46.67
<i>Elymus smithii</i>	10.00	11.69	56.67
<i>Juncus sp.</i>	0.17	0.90	3.33
<i>Juncus arcticus</i>	0.33	1.80	3.33
<i>Stipa hymenoides</i>	0.33	1.80	3.33

**Table 2: Total cover and composition (2009).**

<b>MILLER CANYON PORTALS</b>		
<b>A. COVER</b>	<b>MEAN</b>	<b>STD. DEV.</b>
Total Living Cover	39.50	7.89
Litter	17.17	12.69
Bareground	14.83	11.29
Rock	28.50	14.67
<b>B. % COMPOSITION</b>		
Shrubs	33.07	25.39
Forbs	1.67	6.24
Grasses	65.26	25.62

**Table 3: Woody species density (2009).**

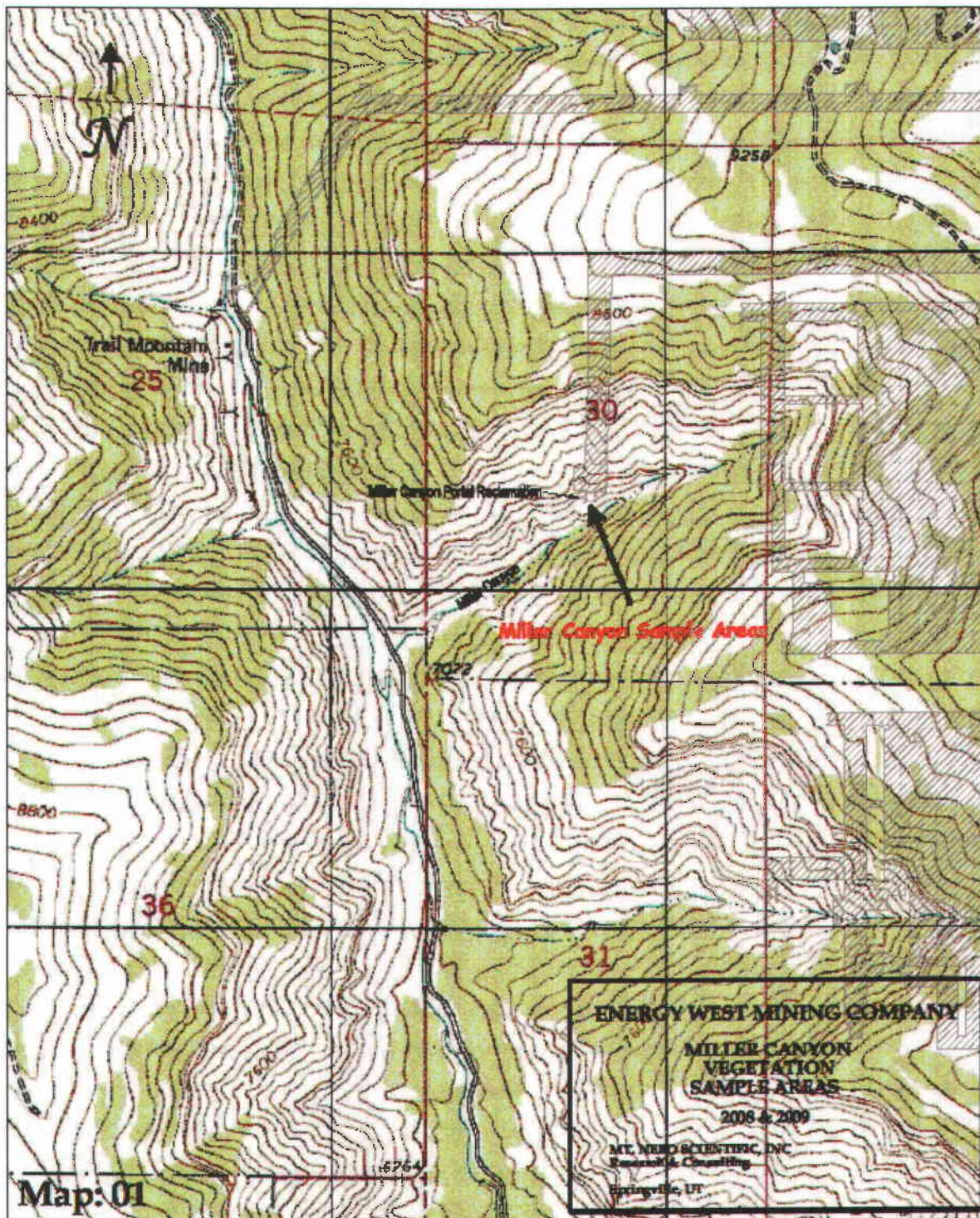
<b>MILLER CANYON PORTALS</b>	<b>Number/Acre</b>
<i>Artemisia tridentata</i>	48.40
<i>Atriplex canescens</i>	435.60
<i>Atriplex confertifolia</i>	48.40
<i>Chrysothamnus nauseosus</i>	580.80
<i>Eriogonum corymbosum</i>	145.20
<i>Gutierrezia sarothrae</i>	1306.80
<i>Salix exigua</i>	871.20
<b>TOTAL</b>	<b>3436.40</b>

**Table 4: Cover and frequency by plant species (2009).**

MILLER CANYON REFERENCE AREA			
	MEAN	STD. DEV.	FREQUENCY
<b>TREES &amp; SHRUBS</b>			
<i>Atriplex confertifolia</i>	2.75	5.80	20.00
<i>Chrysothamnus nauseosus</i>	1.75	5.76	10.00
<i>Eriogonum corymbosum</i>	1.90	3.48	25.00
<i>Gutierrezia sarothrae</i>	4.75	5.36	55.00
<i>Juniperus osteosperma</i>	0.35	1.53	5.00
<b>FORBS</b>			
<i>Machaeranthera grindelioides</i>	0.25	1.09	5.00
<b>GRASSES</b>			
<i>Elymus salinus</i>	21.00	9.17	95.00
<i>Juncus arcticus</i>	1.75	7.63	5.00

**Table 5: Total cover and composition (2009).**

MILLER CANYON REFERENCE AREA		
A. COVER	MEAN	STD. DEV.
Total Living Cover	34.50	5.89
Litter	13.00	9.92
Bareground	19.00	11.36
Rock	33.50	13.14
<b>B. % COMPOSITION</b>		
Shrubs	33.20	22.96
Forbs	0.56	2.42
Grasses	66.25	22.55



**Application for Phase II and III Bond Release  
Miller Canyon Portal Site**

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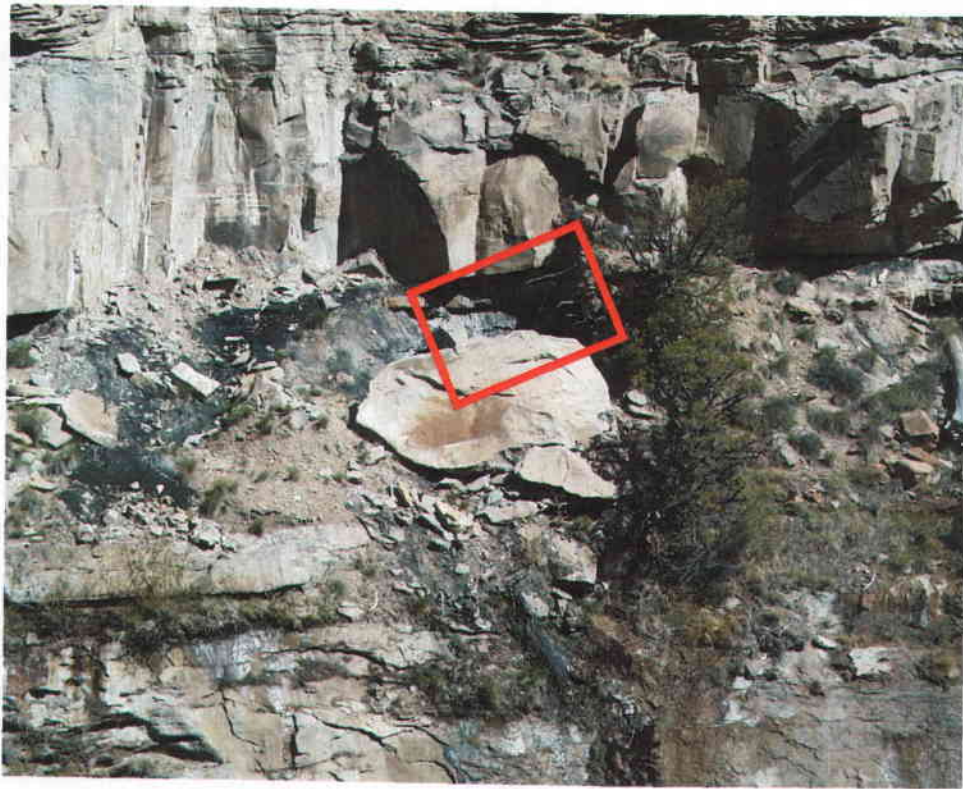
**Attachment 9  
Demonstration that Area is Not Contributing Suspended  
Solids Outside Permit Area**

### **Demonstration that Area is Not Contributing Suspended Solids Outside Permit Area**

Because of the insignificant size of the Miller Canyon Portal area, modeling this area using RUSLE is not practical. The illustrations below in photos 4, 5 and 6 show that vegetation is quite established. Background sedimentation from undisturbed areas is far more substantial and contributes far more sediment to the receiving stream than the Miller Canyon Portal area. However, there is no data to back this claim.



**Photo 1: Portal #1 (Pre-Reclamation 5/1999)**



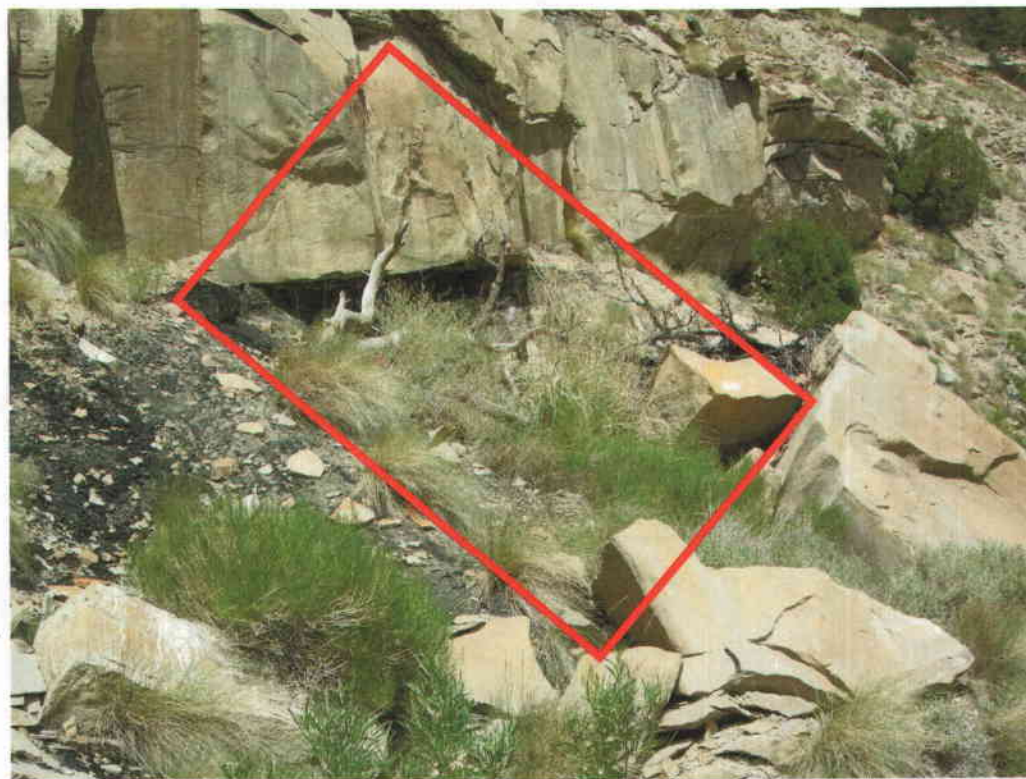
**Photo 2: Portal #2 (Pre-Reclamation 5/1999)**



**Photo 3: Portal #3 (Pre-Reclamation 5/1999)**



**Photo 4: Portal #1 (Post-Reclamation 7/2010)**



**Photo 5: Portal #2 (Post-Reclamation 7/2010)**



**Photo 6: Portal #3 (Post-Reclamation 7/2010)**

**Application for Phase II and III Bond Release  
Miller Canyon Portal Site**

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**Attachment 10  
Demonstration that Responsibility Period has been Met**

## **Demonstration that Responsibility Period has been Met**

As stated in the Utah Coal Regulations, R645-301-357 Revegetation: Extended Responsibility Period:

357.100. The period of extended responsibility for successful vegetation will begin after the last year of augmented seeding, fertilization, irrigation, or other work, excluding husbandry practices that are approved by the Division in accordance with paragraph R645-301-357.300.

*There has been no augmented seeding at the Miller Canyon Portal Breakouts.*

357.200. Vegetation parameters identified in R645-301-356.200 will equal or exceed the approved success standard during the growing seasons for the last two years of the responsibility period. The period of extended responsibility will continue for five or ten years based on precipitation data reported pursuant to R645-301-724.411, as follows:

357.210. In areas of more than 26.0 inches average annual precipitation, the period of responsibility will continue for a period of not less than five full years.

357.220. In areas of 26.0 inches or less average annual precipitation, the period of responsibility will continue for a period of not less than ten full years.

*Meteorological weather data has been collected by PacifiCorp since 1980 (refer to Annual Report.) This data indicates that the 26 year average annual precipitation for the East Mountain area, which includes the Cottonwood/Wilberg Mine Site, is 12.9 inches. Since this amount is less than 25 inches, SMCRA specifies that the responsibility period [for Energy West mines] will be ten full years. The ten year responsibility period was completed in full for the Cottonwood/Wilberg Miller Canyon Portal site in June of 2009.*

*Vegetation monitoring for Phase II and III bond release occurred in 2008 and 2009. The standards of success for this area are as follows:*

*Shrub density set at 0*

*Ground cover will be 90% (with a 90% confidence level) of the reference area*

*The similarity index will be 70% of the reference area.*

*As concluded in the year 9 and year 10 vegetation monitoring report all success standards have been met. A summary of the standards for year 10 monitoring are outlined below.*

*Shrub density – reported by type and in numbers per acre*

*Ground cover – living cover equals 114.5% of reference area*

*Similarity – 81.2% similar*

*Refer to Attachment 8 for both year 9 and year 10 vegetation monitoring reports.*

**Application for Phase II and III Bond Release  
Miller Canyon Portal Site**

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**Attachment 11  
Demonstration that Post Mining Land Use has been  
Achieved**

### **Demonstration that Post Mining Land Use has been Met**

Land use for the Wilberg Mine was established in the early 1980's as grazing and wildlife. This land use information is found in Volume 2, Part 2, starting on page 175 of the mining and reclamation plan. However, the Miller Canyon Portal Breakouts are a satellite facility not connected with the Wilberg Mine. The land use information for this site is outline in Volume 7, Appendix XXII. The information states..."Post-mining land use for the Cottonwood mine is grazing and wildlife. Given the fact that the portals are located on steep (nearly vertical) rock outcrops, this area is only considered for wildlife. It is highly unlikely that cattle could access the steep ledges in and around the portal areas. Recent site visits found no signs of any cattle grazing in the immediate area."

Because the site is small and relatively inaccessible, vegetation establishment will be the only means of demonstrating post mining land use expectations. Since all success standards for vegetation establishment have been met, land uses for grazing and wildlife have been met as demonstrated by a successful vegetative stand in that area.